

Bayrakaroglu Patent No. 5,166,033 is respectively traversed. The rejection is believed to be incorrect for the reasons set forth hereinafter.

Claim 1, the only independent claim, is directed to a process for fabricating a semiconductor device having a buried layer and it requires, inter alia, forming a buried implanted impurity region at a location beneath the surface of a substrate where a buried layer is to be and placing the substrate inside a reactor furnace and then, while the substrate is maintained in that reactor furnace, providing a non-oxidizing atmosphere in the furnace and annealing the substrate to activate implanted impurity ions and diffuse the buried implanted impurity ion region upwardly and downwardly from the location beneath the surface of the substrate while increasing the reactor temperature up to a first temperature and then before the buried ion implanted region beneath the surface expands upwardly from the location below the surface sufficiently to reach the surface, changing the internal temperature of the reactor furnace to a second temperature at which an epitaxial crystal starts to grow on the surface and introducing an epitaxial growth gas into the reactor furnace.

With this method, an implanted ion region beneath the surface of the substrate is produced in such a way that there is no chance that crystal defects are produced in the substrate surface and no autodoping of the epitaxial layer is caused. Moreover, the problems resulting from carrying out the annealing step and the epitaxial growth step and different furnaces are effectively eliminated.

This unique method is not disclosed in or in any way suggested by the prior art relied upon in support of the rejection. In the Japanese reference, there is nothing that

states or in any way implies that the steps are carried out "all in the same reactor furnace in a non-oxidizing atmosphere". As acknowledged by the Examiner, that reference is completely silent on the nature of the atmosphere in the furnace during the course of the annealing process, and contrary to the Examiner's contention, it is improper to read into that reference the presence of a non-oxidizing atmosphere during that step. On the contrary, there is no implication whatsoever that the atmosphere should be non-oxidizing in the Japanese process.

Furthermore, the Examiner incorrectly asserts that a non-oxidizing atmosphere is inherent based on the fact that there is no disclosure in either of the Japanese reference or the Wolf reference regarding oxide formation and removal. It is clearly improper to read into the disclosures of those references a requirement for a non-oxidizing atmosphere when the same result can be accomplished by removing an oxide layer formed as a result of annealing in an oxidizing atmosphere. Thus, the absence of disclosure cannot be used to imply the presence of a condition required by the claimed process.

Furthermore, the Bayraktaroglu reference does not overcome the deficiencies of the Japanese reference and Wolf. Contrary to the contentions in the Examiner's action, Bayraktaroglu does not disclose or suggest an annealing process carried out in the same reactor as an epitaxial growth process but merely teaches activation of implanted ions and epitaxial growth in the same reactor. Activation of implanted ions does not require or imply annealing and a person skilled in the art reading the Bayraktaroglu disclosure would not be led to reconstruct the processes of the Japanese reference and Wolf to carry out annealing in the same reactor as epitaxial growth as required by claim 1.

Furthermore, there is no suggestion in any of the references that the disclosure of the Japanese reference or Wolf should be modified by the disclosure of the Bayraktaroglu reference. As noted in the cases cited in the previous response filed December 26, 2001, it is essential that there be a teaching, motivation or suggestion in the prior art to combine or modify reference disclosures and it is insufficient to rely on an assertion that it would "be within the scope of one of ordinary skill in the art" as stated in the Examiner's Action. There is no such suggestion in any of the references and the Examiner has not even cited any part of a reference in support of an assertion that the modifications require to meet the claim requirements is suggested by the prior art.

Accordingly, claim 1 is clearly patentable over the prior art, including the newly cited reference, and should be allowed along with its dependent claims 3-6.

Further and favorable action is respectfully requested.

Respectfully submitted,



Francis J. Hone
Patent Office Reg. No. 18,662
BAKER BOTTS L.L.P.
30 Rockefeller Plaza
New York, New York 10112-0228
Attorney for Applicants
(212) 408-2534

Dated: August 27, 2002